

# Frequency of Gestational Diabetes in Pregnant Women with Hepatitis C in Civil Hospital Karachi

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## ABSTRACT

**Objectives:** To evaluate the frequency of gestational diabetes in pregnant women with hepatitis C who presented at civil hospital Karachi

**Subject and Methods:** This cross-sectional study was done at the Gynae and OBS department of Civil Hospital Karachi during the period of one year from December 2019 to December 2020, after obtaining approval from the IRBD of DUHS, DMC Civil Hospital, Karachi. Pregnant women with singleton pregnancies aged 16 to 45 years with positive HCV antibodies according to Elisa method tests were included in the study. Eligible patients were tested for glucose tolerance by performing an OGTT. The serum glucose level was measured using a glucometer. A study proforma was used to collect the information, and the data was analyzed using SPSS version 26.

**Results:** A total of 197 HCV positive pregnant women were studied; their average age was 28.83±3.77 years and their average gestational age 25.95±1.45 weeks. The frequency of gestational diabetes among pregnant women with hepatitis C was 35.53% (70/197). The rate of gestational diabetes was associated with age groups ( $p = 0.020$ ), while the frequency of gestational diabetes was statistically insignificant according to gestational age and duration of HCV ( $p > 0.05$ ).

**Conclusion:** As per the study conclusion, the frequency of gestational diabetes was observed to be frequently high among HCV positive pregnant women. Based on these findings, pregnant women who have HCV are at an increased risk of developing gestational diabetes.

**Keywords:** HCV, pregnancy, Gestational diabetes

## INTRODUCTION

Hepatitis is a condition in which the liver tissue becomes inflamed. Hepatitis C viruses are the most prevalent cause of hepatitis in the world. The widespread incidence throughout the world, a significant cause of deaths and morbidities, and the lower interest rates of its detection and management are still significant challenges of the public health.<sup>1</sup> There are several transmission routes for the virus, like vertical and sexual transmissions, and some other ways, and pregnant women play a key role in each of these modes of transmission. During pregnancy, hepatitis viruses can cause hepatic failure as well as other complications, such as gestational diabetes mellitus (GDM).<sup>3</sup> GDM is a type of glucose intolerance that develops or is first seen during pregnancy. The largest occurrence of GDM<sup>4</sup> has been discovered in Asian women, notably Chinese women. Women who have GDM have an increased risk of having several adverse maternal and fetal consequences, such as c-section, macrosomia, later-life diabetes, and the birth trauma, despite the fact that therapy reduces these risks greatly<sup>5</sup>. Until date, several types of liver illness have been linked to diabetes, and HCV chronic infection has been linked to an increased risk of diabetes mellitus (DM).<sup>6,7</sup> HCV infection has been linked to insulin resistance (IR)<sup>8</sup>, suggesting that it may enhance the likelihood of developing diabetes and/or GDM. GDM was detected in 9.5% of the infected population by HCV, while in 6.8% of the population that had been tested generally, according to research published in J Obstet Gynecol Can<sup>9</sup>. However, there are fewer research in this area.<sup>8-10</sup> Furthermore, it is yet unknown whether HCV infection has an unfavourable effect on glucose metabolism during pregnancy and, if so, how often. As a result, the goal of this study was to examine how common GDM is among HCV-infected women during pregnancy. There seems to be the indication that HCV and diabetic mellitus (DM) are related. Predisposition to GDM is suggested by the insulin-resistant condition of pregnancy in HCV-infected women.<sup>9</sup> However, this study has been conducted to evaluate the frequency of gestational diabetes in pregnant women with hepatitis C who presented at civil hospital in Karachi.

## MATERIAL AND METHODS

This cross-sectional study was done at the Gynecology and Obstetrics (OBS) Department of Civil Hospital Karachi. The study was done during a period of one year, from December 2019 to December 2020, after obtaining approval from the IRBD of DUHS, DMC Civil Hospital, Karachi. All the pregnant women with singleton pregnancies, aged between 16 and 45 years, who had positive HCV antibodies as per Elisa method tests were included. All the women with a medical history of diabetes types I and II, chronic hypertension, women who had a history of using corticosteroids at least 30 days prior, hyperglycemia detected in the early stages of pregnancy, failure to complete the 75-gram GCT prior to the completion of 28 weeks of pregnancy, and those who did not agree to take part in the study were excluded. All eligible patients were tested for glucose tolerance by performing an OGTT using the American Diabetes Association One Step Procedure. The morning OGTT was performed after a more than eight-hour overnight fast, 75-gram Oral Glucose Tolerance Test (OGTT) with fasting plasma glucose measurements, 1-hour and 2-hour screenings between 24-28 weeks for women who did not have a previous diagnosis of diabetes, GDM was considered positive if the +ve plasma glucose values were equal to or greater than:

- Fasting serum glucose (92mg/dl)
- 1 hour serum glucose (180mg/dl)
- 2 hour serum glucose (153mg/dl)

The serum glucose level was measured using a glucometer. Study proforma was used to collect the information, and the data was analyzed using the SPSS version 26.

## RESULTS

A total of 197 women during pregnancy having positive HCV antibodies were studied. The average age of the patients was 28.83±3.77 years, with an average gestational age and duration of HCV was 25.95±1.45 weeks and 3.30±1.53 years, as shown in table 1.

The frequency of gestational diabetes among pregnant women with hepatitis C was 35.53% (70/197) as presented in figure 1.

The rate of gestational diabetes was associated with age groups ( $p=0.020$ ). Similarly rate of gestational diabetes was not statistically significant with gestational age and duration of HCV, as shown in table 2.

Table 1: Descriptive statistics of age, gestational age and HCV duration  $n=197$

Variables	Statistics
Age (years)	28.83±3.77
Gestational age (weeks)	25.95±1.45
HCV duration (years)	3.30±1.53

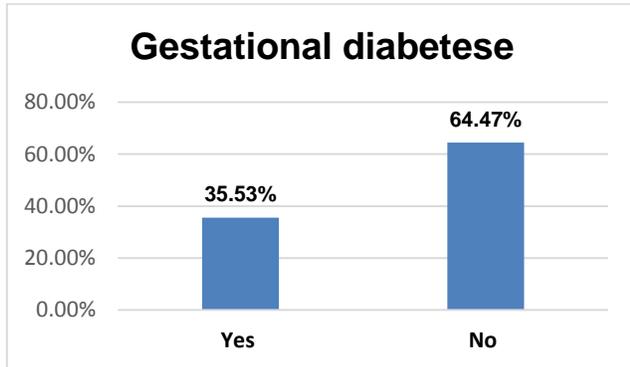


Fig. 1: Frequency of gestational diabetes in HCV positive pregnant women  $n=197$

Table 2: Frequency of gestational diabetes with respect to the age, gestational age and duration of HCV  $n=197$

Variables		Gestational diabetes		p-value
		Yes	No	
Age groups	< 25	05	32	0.025
	26-30	45	64	
	31-35	16	26	
	>35	04	05	
Gestational age	≤26 Weeks	43	83	0.583
	>26 Weeks	27	44	
HCV duration	<4	51	85	0.389
	≥4	19	42	

**DISCUSSION**

Hepatitis seems to be an infection of the liver that is characterized as the presence of inflammatory cells there in organ's tissue.<sup>11</sup> Infection of HCV is unquestionably considered a major public health issue, with a worldwide prevalence estimate of 2.8%, corresponding to about 185 million infective events and annually more than 350,000 deaths.<sup>12</sup> Furthermore, the global frequency of HCV in women during pregnancy is diverse, while in Pakistan, the frequency of HCV in pregnant females ranges from 0.7 percent to 36 percent.<sup>1</sup> Un-fortuitously, this rising HCV prevalence among pregnant women, makes them susceptible to various complications.<sup>12</sup>

This study has been conducted to evaluate the frequency of gestational diabetes in pregnant women with hepatitis C, and we found the frequency of gestational diabetes among pregnant women with hepatitis C to be 35.53%. Consistently, Pinnetti C et al<sup>13</sup> reported that the twenty (25.6%) of the HCV infected women had glucose metabolism abnormalities in accordance with the criteria of NDDG, while these women were also infected by HIV. However, our findings were much higher than a study conducted in British Columbia,<sup>11</sup> reported the prevalence of GDM in HCV infected was 9.5%, moreover, the proportion of type 2 diabetes is projected to be 3.7% in Canada.<sup>14</sup> On the other hand, publications that looked at how pregnant HBV-positive women fared have produced inconsistent findings about the prevalence of GDM, and it is reported that for the Gestational diabetes mellitus, the incident hazard ratio has been 1.75%.<sup>15</sup> There were relatively few studies

conducted on the effects of a chronic HCV infection during pregnancy, as well as on the health consequences for both the mother and the newborn.<sup>9</sup> In point of fact, just two of the studies that have been conducted particularly to investigate how HCV infection affects GDM have been published.<sup>9,16</sup>

According to the previously published reports, HCV can cause beta-cell malfunction and contribute to the emergence of the resistance of the insulin.<sup>13,17,18</sup> Ultimately, according to these findings, it seems to be hypothesized that HCV could function as a co - factor, which might not always be relevant clinically in causing GMAs during gestation but may do so in the involvement of other concurrent comorbid conditions that are variable in representation across various populations.<sup>13</sup> There have also been stated about the negative effects of chronic HCV infection on the mother, like an increased chance of developing intrahepatic cholestasis, premature birth, and gestational diabetes.<sup>19</sup> In the line of this study, in an international study stated that women who were infected by HCV were shown to have a larger risk of early membrane rupture and, among women who gained excessive amounts of weight during pregnancy, an increased risk of acquiring GDM.<sup>16,20</sup> The incidence of hepatitis C virus infection amongst women during pregnancy is increasing globally, and recent AASLD recommendations and guidelines by IDSA suggest that all the women during gestation, regardless of their individual risk profiles, should be tested for HCV. Although, the SMFM continues to support risk-based HCV screening.<sup>21</sup> For the purpose of providing obstetrics practitioners who are going to screening women during pregnancy with a clear suggestion, attention should be focused on standardizing these recommendations among specialized societies. If such guideline for comprehensive HCV screenings is adopted, a greater number of pregnant women who have HCV would be diagnosed. There is limited data regarding gestational diabetes risk in pregnant women with hepatitis C, and due to several limitations of the current study, additional large-scale publications are needed to answer the specific aspect regarding whether or not HCV infection as a particular contributing factor for GDM.

**CONCLUSION**

According to the findings of the study, the frequency of gestational diabetes was found to be frequently higher among HCV-positive pregnant women. According to data, pregnant women who are infected with HCV have a greater probability of developing gestational diabetes. HCV infected women during pregnancy must be presumed to be the higher risk patients to develop the GDM and required plasma glucose monitoring might be satisfactory in order to optimize diagnosis and treatment, to decrease the GDM risk, and early management to improve the feto-maternal outcome in such cases.

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